CLAIMS:

1. A device for scanning a surface comprising optically detectable marks along a scan line, which device comprises a radiation source for emitting a radiation beam, an objective system for guiding the radiation beam to the surface, a radiation-sensitive detection system for receiving radiation from the surface and an electronic circuit for processing output signals of the detection system, characterized in that the detection system comprises a plurality of detectors, each detector having an output for providing a detector signal, and in that the device comprises an electronic circuit for forming a time difference between corresponding parts of the detector signals relating to passage of the radiation beam over one of the marks and for generating from the time difference a signal representing a wavefront aberration of the radiation beam.

2. Device according to Claim 1, the detection system comprises four consecutive sub-detectors a, b, c and d in the direction of the scan line, and the signal representing tangential coma is proportional to

$$t(a-b) - t(c-d),$$

where t(n-m) is the time difference between detector signals of sub-detectors m and n.

3. Device according to Claim 1, the detection system comprises four consecutive sub-detectors a, b, c and d in the direction of the scan line, and the signal representing spherical aberration is proportional to

$$t(a-b) + t(c-d),$$

where t(n-m) is the time difference between detector signals of sub-detectors m and n.

4. Device according to Claim 1, wherein the detectors are arranged at both sides of a dividing line, extending effectively in a direction perpendicular to the scan line.

5. Device according to Claim 1, wherein the detectors are arranged at both sides of a dividing line, extending effectively in a direction perpendicular to the scan line, and

comprising a servo circuit arranged for wobbling the position of the radiation beam in a direction perpendicular to the scan line.

6. Device according to Claim 1 arranged for scanning optical record carriers.

7. A device for scanning a surface comprising optically detectable marks along a scan line, which device comprises a radiation source for emitting a radiation beam, an objective system for guiding the radiation beam to the surface, a radiation-sensitive detection system for receiving radiation from the surface and an electronic circuit for processing output signals of the detection system, characterized in that the detection system comprises eight detectors arranged in four quadrants, each quadrant being split at a radius in an inner part and an outer part, each detector having an output for providing a detector signal, and in that the device comprises an electronic circuit for forming a time difference between corresponding parts of the detector signals relating to passage of the radiation beam over one of the marks and for generating from the time difference a focus error signal.

8. Device according to Claim 7, wherein the focus error signal is proportional to

$$(t_{a1} + t_{d1}) + (t_{a2} + t_{d2}) - (t_{b2} + t_{c2}) - (t_{b1} + t_{c1})$$

where t_e is a time difference between corresponding parts of detector signal e relating to passage of the radiation beam over one of the marks and a reference signal, the detector signals labelled '1' and '2' pertaining to detectors in the outer part and inner part, respectively of a quadrant, the detectors in four subsequent quadrants being labelled 'a', 'b', 'c' and 'd'.

9. A method for scanning a surface comprising optically detectable marks along a scan line, in which method a radiation beam is guided to the surface, and a radiation-sensitive detection system receives radiation from the surface, characterized in that the detection system comprises a plurality of detectors, each detector providing a detector signal, and in that a time difference is determined between corresponding parts of the detector signals relating to passage of the radiation beam over one of the marks and a signal representing a wavefront deviation of the radiation beam is formed from the time difference.

10. A method for scanning a surface comprising optically detectable marks along a scan line, in which method a radiation beam is guided to the surface, and a radiation-sensitive detection system receives radiation from the surface, characterized in that the detection system comprises eight detectors arranged in four quadrants, each quadrant being split at a radius in an inner part and an outer part, each detector providing a detector signal, and in that a time difference is determined between corresponding parts of the detector signals relating to passage of the radiation beam over one of the marks and a focus error signal is formed from the time difference.

11. An optical record carrier for being scanned by an optical system having a predetermined cut-off frequency and having an information layer in which information is stored in the form of optically readable marks arranged in tracks, characterised in that at predetermined parts along the tracks a first pattern of marks and a second pattern of marks are located, the first pattern having a spatial frequency in a range from 0.14 to 0.2 times the cut-off frequency and the second pattern having a spatial frequency in a range from 0.35 to 0.5 times the cut-off frequency.